AUGUST 1973

DRIVER

SUNGLASSES
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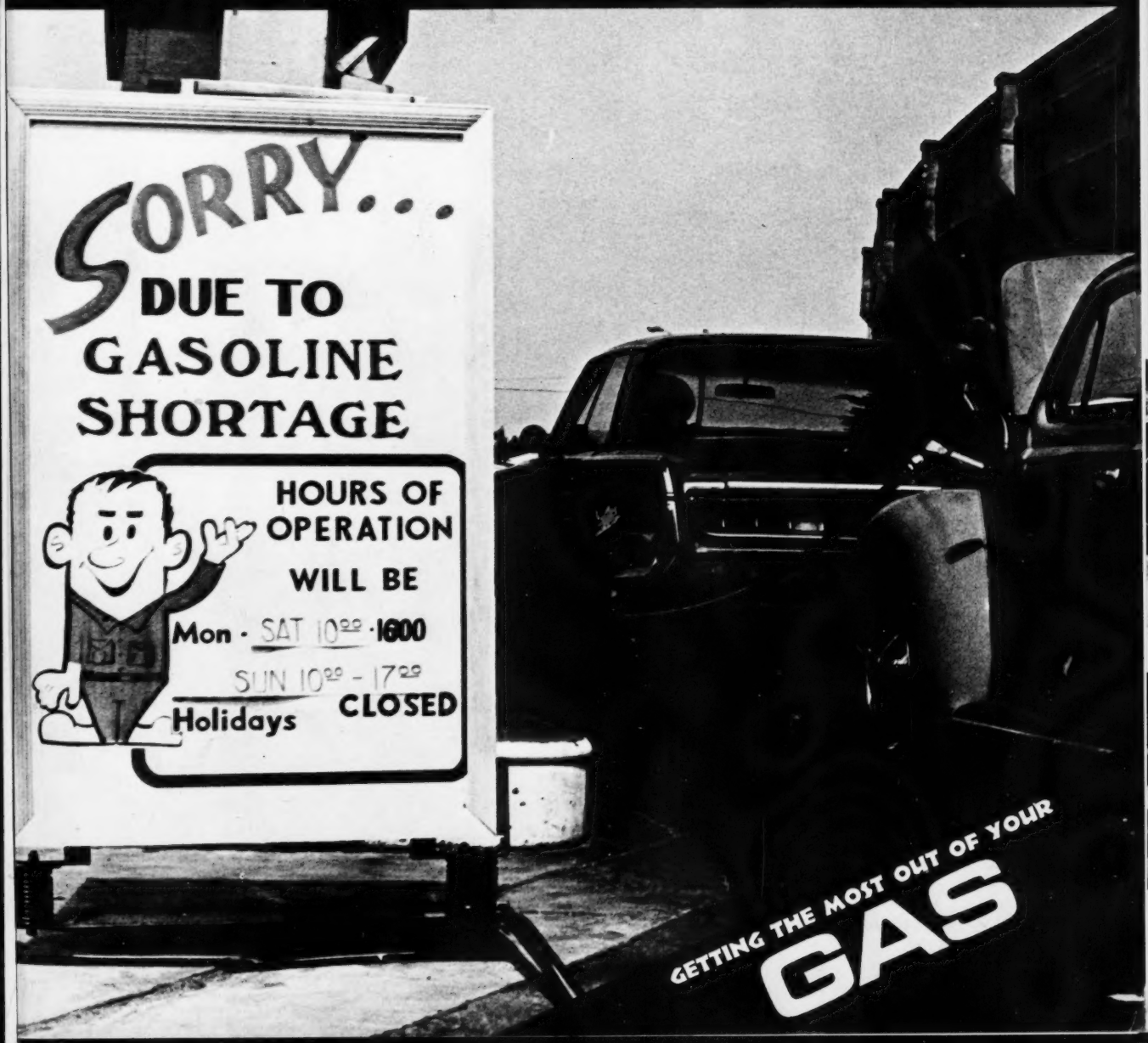
NAVY DAY AT THE RACES ● OPINIONS



GETTING THE MOST OUT OF YOUR
GAS

GETTING THE MOST OUT OF YOUR GAS

Remember when gas wars were everyday occurences, prices were low, and you didn't care how much fuel your car used—when it was even "in" to brag about how few miles per gallon you got?

Well, it's no longer cool to get only a few mpg—it's very expensive. And, the only thing resembling a gas war is the battle you face trying to get to a station before it runs out of gas, or find an open station on a busy weekend.

You might already be having trouble getting gas when you want it. But, in any case, the cost of a fill at the corner station is bound to make you ponder ingenious methods of using less of the precious liquid.

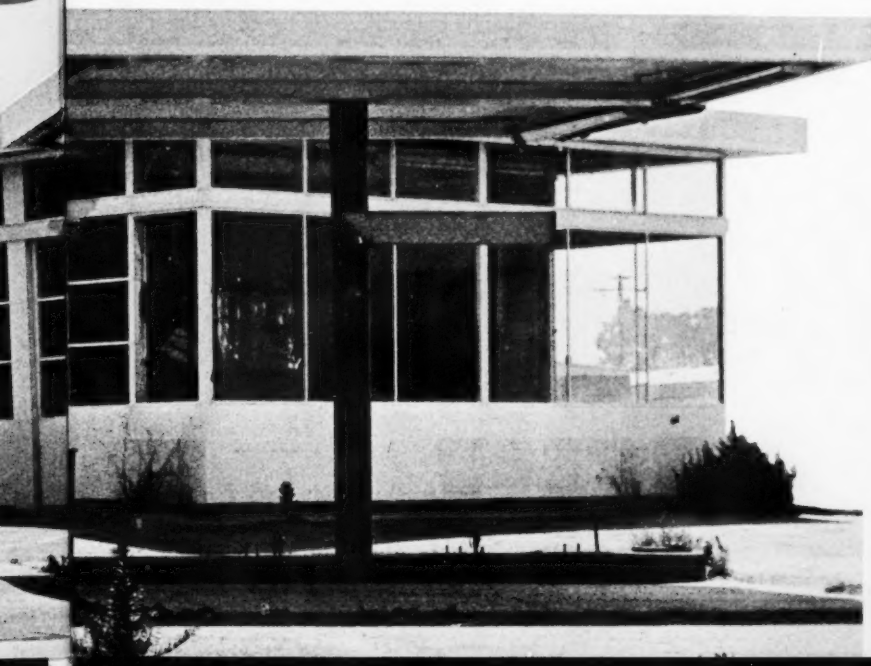
Economy driving pays in many ways

The two best ways of saving gasoline and money, however, aren't even ingenious. You can do your part for the energy crisis, as well as your budget, by simply driving less and using less gas when you drive. Driving fewer miles seems simple enough—but what about using less gasoline? Actually, you'll probably find that cutting your car's fuel consumpiton is much easier than reducing the number of "unnecessary" miles you drive.

NO FUN?

Getting good gas mileage is really very simple—all it requires is driving at slower speeds, and avoiding fast acceleration and hard stops. This may not sound like a whole lot of fun, at first. But it *can* become a sort of interesting challenge, and the gasoline saved is more than worth the effort. You can save up to 5 mpg by modifying your driving technique in this manner. And, at today's gas prices, the money you save will buy a lot of fun elsewhere.

Don't depend totally on a station attendant to put your gas cap back on, or to tighten it properly. Check the cap yourself to prevent costly overflow. With some horizontal gas filler pipes, a missing gas cap can result in gas siphoning at highway speeds. It happens often. (top)



MECHANICAL FACTORS

Before you can consider driving economically, however, you have to get your vehicle in shape and keep it that way. The first step in maximizing fuel economy is a thorough tuneup. A study conducted a few years ago by the Champion Spark Plug Company, and certified by an independent agency, showed that the average car's gas mileage can be improved nearly 10 per cent with a basic tuneup. Ignition timing and spark plug gap are the adjustments *most* critical to gas mileage according to economy driving experts.

A dirty air filter and dirty or incorrectly adjusted carburetor, the most common gas thieves, should also be cleaned, replaced, or adjusted at every tuneup. A plugged air filter alone will cut your mileage about 10 per cent, as well as dropping performance a similar amount.

Don't neglect emission control systems,* the automatic choke, and the fuel lines (they can develop leaks)—all potential gas robbers.

TIRES

Tires and tire pressure are an important factor in gas mileage. Radial-ply tires, because they have less roll resistance, often improve a car's gas mileage by 2 mpg. This doesn't do you much good if you don't have radials, but it might be a good point to consider when it comes time for new skins.

Tire pressure is something which affects everyone, however. If your tires are just slightly underinflated, the increased roll resistance can cost you 1 mpg at highway speeds. To insure maximum gas mileage and tire life, inflation pressures should always be maintained at the levels specified in your owner's manual. Don't forget to increase the in-

continued

** See the "Back-Yard Mechanic," page 22, this issue.*

DRIVER

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NEXT MONTH
Alcohol Special

THE EDITOR SPEAKS

DOUBLE CLUTCH

Don't get hung up on traffic signals

It's funny thing○about drivers and green traffic lights. Most drivers interpret a green light as carte blanche to immediately blast across an intersection. In fact, there are some drivers who have made getting the jump on the green light a sort of weird self-competition. It goes like this:

The driver sits in his car which is first in line at an intersection. He sort of idly looks around, periodically throwing a glance at the traffic signal. Then, he suddenly rivets his *complete* attention on the signal because he has noticed the green-to-yellow-to-red sequence activating for the cross traffic. At this point he tenses for the takeoff, revs the engine, ready to pop the clutch simultaneously with the change to green. He's afraid even to wink for fear of blowing his takeoff. Then, the checkered flag drops, so to speak, and he's off with a screech of rubber.

We've all done this, I'm sure. The males have, anyway. It was sort of "kicks" at the time, and fortunately it wore off quickly for most of us. Yet, for others, maybe it hasn't. These drivers might want to consider a thought along these lines; other drivers ought to consider this also.

What about the other traffic? There quite possibly is another type of signal freak approaching your signal with a conflicting thought in mind. Here's how *he* sees it:

He knows he's late for the signal sequence because of the long line of cars behind you. And, as he nears the intersection his fears are confirmed as the light turns from green to yellow to. . .

continued on page 27

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flation levels for carrying a load, and for driving at a sustained highway speed, as recommended in your manual.

Keeping the wheels balanced, the front-end aligned, and the shocks in good condition also reduces roll resistance and increases fuel economy. In addition, keeping these items well maintained will improved tire life, as well as ride safety and comfort.

Low air pressure costs you 1 mpg on the road—keep tires inflated to the pressures recommended in your owner's manual.

THE OLD EGG ROUTINE

While mechanical condition is an important prerequisite to getting good gas mileage, what you do behind the wheel is the *most important key to economy driving*. You might remember the old TV commercial which depicted the good driver as a person who drives as if he has an egg between his foot and the accelerator. Well, as unexciting as it sounds, driving this smoothly is exactly what's required for good gas mileage.

ON THE ROAD

Keeping a light and steady foot on the gas pedal during acceleration will get you started toward good mileage. It's not necessary to creep around, however, and create a traffic hazard. Accelerating reasonably won't hurt your mileage—the important thing is not jumping on the accelerator. This just squirts excess gas into the carburetor which is then wasted.

Highway cruising with a light foot is what really pays off in miles per gallon, since fuel economy is best at a sustained, lower speed. For instance, if you cruise at a steady 50, instead of 70 mph, you will save around 5 mpg. Maximum fuel economy actually occurs around 35 mph and decreases at faster speeds. Obviously, it's not feasible or legal to drive this slowly on most highways. However, a cruising speed around 55 mph will produce good gas mileage if you keep your speed constant and your foot steady.

You can maintain a steady foot and constant speeds by simply concentrating on driving and keeping your eyes moving at all times. By doing this, you can spot trouble areas on the road and gradually slow or move around them, and avoid gas-robbing speed changes and stops. Decelerating gradually as you near traffic lights, allowing them to turn green before you reach the intersection will also help limit unnecessary stops.

When approaching hills, accelerate moderately, so the momentum can carry you over the crest without having to accelerate up the hill—a real gas waster. Finally, you should drive on limited access highways as much as possible, since fewer stops and speed changes are required on these roads.

Cruising with a steady foot is really pretty easy. Most of us do it unconsciously on the highway. But, many people really blow their mileage during lane changes. There's no reason to "can it" and then brake when you enter the new lane. If you're driving alertly, you should be able to change lanes slowly and safely without altering your speed—this will save plenty of gas on a long day of interstate driving.

DON'T DRIVE

Limiting unnecessary driving is the best way to lower your gasoline bill. A good method is to consolidate your short errand hops into one trip. Doing this saves an extra amount of gas by reducing stops and speed changes, as well as engine restarts. More gas is wasted when an engine is shut off and restarted than at any other time. However, you should not let your car idle for long periods when waiting at a railroad crossing or when stuck in a traffic jam.

WARM UP?

Another good way to cut your fuel consumption is by eliminating the traditional warm up period. Letting your car idle for 5 minutes before pulling out just wastes gas. Instead, simply drive away and limit your speed for the first mile or so (without lugging the engine). The gas saved will add up. Also, the cold engine will warm more efficiently and get more complete lubrication because of faster oil circulation.

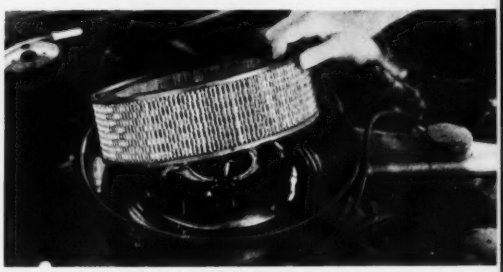
TRIP MILEAGE

On long vacation drives, many of us are concerned about squeezing a few extra miles out of a tank of gas. The easiest way to do this, other than following the aforementioned suggestions, is to get an extra early start each morning. This will allow you to do most of your driving in the coolest part of the day. Your car will run better, and you

continued

Drive steadily, at reasonable speeds.

Drive as if you have an egg between your foot and the gas pedal—avoid fast acceleration, hard stops, and unnecessary speed changes.



A dirty air filter is one of the most common gas robbers. Replace it every 12,000 miles, or when plugged.

continued

GETTING THE MOST OUT OF YOUR GAS

can minimize the use of the car air conditioner.

Although air conditioners in newer cars aren't quite as hard on mileage as those in older models, limiting the use of the "cool air box" will save plenty of gas. Also, by getting an early start, you'll have more time to get where you're going, so you can drive more slowly and carefully—good for gas mileage, safety, and a pleasant trip.

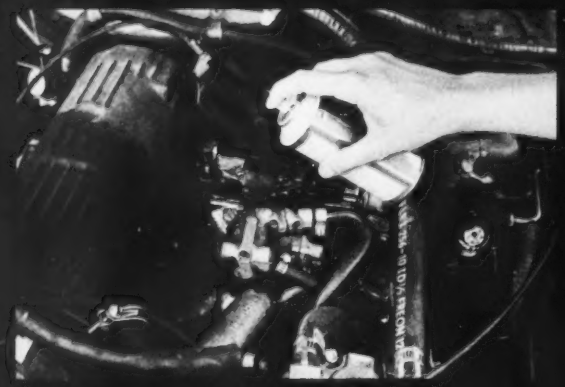
This is basically what getting good mileage is all about. Keep your car in shape, drive smoothly, and maintain constant cruising speeds. In addition to helping preserve our nation's limited fuel supply, and holding down gas expense, you will reap other benefits as well.

Wear and tear on your vehicle will be reduced and exhaust emissions diminished, but there's something even more important. The person who is concerned with fuel economy, and who is constantly mindful of HOW he drives, is far more likely to be a better, safer driver. And that is something to work at, isn't it? ●

The air conditioner saps gas mileage—use it only when necessary.

Self-service pumps are usually priced a few pennies below the full-service pumps. Show your wife or girlfriend how to use the pumps, and the savings will add up. Also, buy the lowest grade (cheapest) gas which burns satisfactorily without knocking or pinging.

A dash—mountable vacuum gage which is calibrated in fuel economy ranges can be used for precise driving (slightly different than the one shown here). By always keeping the gage's needle in the economy zone, you'll know you're getting the best possible gas mileage.



Cleaning a dirty carburetor with aerosol cleaner can up mileage from 2 to 5 per cent. Set the choke only as rich as required to start the engine when cold. Make sure the linkage is free, and spray it regularly with solvent to keep the choke from sticking.

(right)
Driving fast on a wet road, or driving into a strong wind kills your mileage.

(Information from AIDE, "The Insurance Magazine for USAA Members," Winter '73 issue)

Jump Starts

Jump-starting a dead battery is not the simple task you might think it is. It is possible to literally "blow" the job, and this could result in personal injuries and destruction of property.

There is one right way to jump-start a dead battery, and here it is:

- First of all, make sure that both batteries, the "live" one and the "dead" one, have the same rated voltage. Don't try to jump-start a 6-volt battery from a 12-volt battery, you'll burn out the 6-volt battery. On the other hand, a 6-volt battery can't put out enough juice to get through a 12-volter to the car's ignition system.
- Next, make certain that both vehicles have negative-ground electrical systems. A sure way to check this is to look and see which battery cable goes to the car's frame—this is the ground cable. The positive cable goes to the starter.
- Be sure the "dead" battery isn't frozen. It could blow up when you try to push an electrical current through it from the "live" battery. If you're not sure whether the "dead" battery is frozen—don't try to jump-start it.
- The next thing to do is bring both vehicles close together, but don't let them touch, you might get a short circuit.
- Set both parking brakes and put the gears in Neutral or Park.
- Keep the booster car's engine running and turn off all accessory switches in the "dead" car.
- Remove the well caps from both batteries and cover the wells with two pieces of cloth. Now, if you're sure the "dead" battery isn't iced up, you can go ahead with the cable bit.
- Find the positive terminal on both batteries. It will be marked with a "P" or a "+" sign, and sometimes it is painted red.
- Connect one cable clip to the positive terminal on the "live" battery and the other clip *on the same cable* to the positive terminal on the "dead" battery. Jump cables are usually colored red and black to keep you from getting mixed up.
- Now comes the switch from what you probably have done before. *Don't connect the remaining two cable clips to the negative terminals of both batteries.*
- Connect one clip to the negative terminal on the "live" battery, and the other clip to the *"dead" car's frame, at least 12 inches from the battery.* If you get any sparks when you crank up the "dead" motor, they won't be near the battery.
- O.K., now's the time to start the "dead" car's engine.
- As soon as it's running, disconnect the two cables in precisely the *reverse* order.
- Detach the negative clip from the "dead" car's frame, and then remove the clip from the negative terminal on the "live" battery.
- Take the clip off the positive terminal of the "dead" battery and then remove the clip from the positive terminal on the "live" battery.
- Remove the cloths from the battery wells and replace the well caps. Be sure the vent holes are clean.
- Dispose of the cloths where any battery acid on them won't hurt animals or people.
- Now, with the previously "dead" car running, you should take it to a good garage and find out what was wrong with it in the first place.* ●

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* *See "A Little Care Will Do It," Mar '72 DRIVER.*

(above)
Wearing sunglasses saves your energy, but there's another reason to consider using glasses or protective lenses. Every day about 1000 Americans have some type of eye accident. Most could have been prevented had the victims used industrial-quality protective lenses or face shields. When performing eye-hazardous work, such as on your vehicle, make sure your eyes are protected.

(right)
Glare elimination resulting from the use of sunglasses is often dramatic, especially with polarized lenses.

(above and right)
Choosing sunglasses is an important matter. The subtle energy drain that affects a driver on an extended trip under high-glare conditions without sunglasses also affects his driving ability.

(Adapted from a HOT ROD magazine article by Bob Greene)

sunglasses

They can make a noticeable difference in the way you drive or ride

Not too many people really stop to think about how important their eyes are and how much work they do. Your eyes, for example, normally use 25 percent of all your physical energy! Obviously, then, to expose them to undue glare and squinting is to increase the loss of energy. This can cause you to become mysteriously fatigued, give you a headache, and make you irritable, all of which adversely affect your driving.

Twenty-five percent of your body's output is a lot of juice, and it therefore behooves you to guard it jealously. The solution is through a pair of professionally designed and built sunglasses. Unfortunately, a lot of people believe they already have them but really don't. A good lens is usually made of special optical quality glass, and is precisely contoured. It is formulated to filter out all of the invisible (ultraviolet) as well as the infrared (heat) rays. (Plastic, by the way, does not filter infrared rays.)

Additionally, proper sunglasses should offer the correct degree of darkness, passing no more than 30 percent of the light, and preferably only 19 to 20 percent. This caution applies winter and summer, direct light or reflected, bright or overcast. Make sure your glasses are of prescription quality, precision-ground to eliminate defects which could produce eye strain. Also ensure that sunglasses are impact-resistant, per the minimum requirements of the Government.

CHECKING THE GLASS

How can the layman tell a good piece of glass from a pop bottle bottom? Hold the glasses so the light from an overhead fluorescent lamp reflects on the inside of the lens. Moving the glass slightly so the reflection of the overhead light travels slowly across the lens, notice if the reflection of the lamp distorts or wiggles as it passes over the glass. If it does, you've got a bummer and your eyes will encounter strain because of the distortion. Don't be misled by price alone; although legitimate sunglasses start at around $10, there are also some bad ones in this price range.

THE BEST COLOR

Neutral gray and sage green offer the best color perception and least color distortion. A truly neutral gray lens has no color distortion whatsoever. One shade of sage green conforms to the color sensitivity of the eye, and can therefore be a lighter shade (30 percent light transmission) while giving the same protection as a 19-percent neutral gray. Other colors are of lesser or no value as sunglasses, unless you just want to look good.

As for depth of shade, mount them on your face and look into a mirror. If you can see your own eyes very clearly, they're probably too light for harsh outdoor work.

FRAMES

After being so particular about the glass and color, pay attention that it isn't mounted in a junk frame. The temples should be no more than ½-inch wide, a legal stipulation for drivers in many states. Beyond that, make sure that all frame and hinge screws are accessible and rugged. This is especially important for motorcycle riders. Because of the wind and vibration encountered on a motorcycle, it is also advisable to retighten all screws, or at least check their tension after every ride to ensure your specs won't fall apart the next time out. A touch of Loctite on each thread isn't a bad idea.

Plastic frames should have a metal core— a sign of quality—to allow them to be bent and to hold a comfortable fit. Clip-on sunglasses are not advisable, since they add weight and can cause disturbing reflections on occasion.

The street rider who uses a windshield or fairing will be able to get by with a normal-sized pair of prescription-ground sunglasses. Without a fairing, it's best to go with an approved clear-plastic face shield over your sunglasses.

The off-road rider who uses regular goggles is best advised to wear prescription-quality sunglasses under his clear-lens goggles. This will give adequate protection, plus allow him to read the terrain correctly. Another advantage of this method is the practicality of being able to remove the sunglasses in the advent of darkness, leaving the clear goggle lens for protection against wind and dirt.

AT NIGHT

Without sunglasses to protect your eyes from harsh daylight, ensuing night vision can suffer as much as 50 percent! Although temporary, this glare-inflicted handicap can last up to a full week before normal night vision returns!

To ensure normal night vision, remove your sunglasses for nighttime driving or riding. Cycle riders should continue to wear their clear goggles. Avoid looking at bright, flashing electric signs, or directly into the glare of oncoming headlights. If you stop at a brightly-lit restaurant or service station, it's a good idea to wear your glasses while in the bright lights.

If you recognize the value of sunglasses, buy good quality lenses, and use your glasses thoughtfully, chances are you'll have safer, less fatiguing, and happier motoring. ●

NAVY DAY

Ready for the race, Skip Barber depends on a cool head, a well prepared car, and many safety devices to see him safely through the race.

Peter Gethin, second-place finisher, before the start of the race. An assistant is helping to cinch up the driver's safety harness. Note the functional design of the twin rearview mirrors and roll bar.

One hundred thousand horsepower. One million, two hundred thousand dollars' worth of cars. One hundred and fourteen miles-per-hour average around a very twisty 1.9-mile race course.

However you figure it, the starting field of Formula 5000 cars at Laguna Seca Raceway was impressive. Equally impressive was the entry of the U.S. Navy into major American road racing.

THE NAVY IN RACING

The Navy is not new to auto racing. For several years, Navy Recruiting has been deeply involved in drag racing. Even the legendary "Big Daddy" Don Garlits carries the "FLY NAVY" banner on his dragster. But the L&M Championship race at Laguna Seca represents the first time the Navy has carried its message to professional road racing.

Why is the Navy in racing? It seems a personnel study indicated that auto racing crowds contained 2.1 million potential Navy sailors and flyers. As Rear Admiral Emmett H. Tidd, Commander of the Navy Recruiting Command told DRIVER, "Road racing introduces the Navy to the kind of young men we need; those with mechanical interests, who have competitive spirits, and are extremely active. They are the young people who are not involved with drugs; the finest part of young America. They are what the Navy needs."

THE L&M CHAMPIONSHIP

When the Navy chose the L&M Championship for its entry into professional racing, it selected the premier American road racing series. It all began in 1967, with the first American professional road racing series for open wheel cars (fenderless); the Grand Prix Championship.

Since that humble beginning when the champion won slightly more than $4500, the series has increased its prizes to $53,000 in guaranteed purses. And, from the original five races, the series has expanded to nine races run on the top road courses in America.

The cars that run the L&M Championship are single-seaters with four open wheels, on-board self starters, and dual braking systems, plus approved safety equipment including roll bar, fuel cells, six-point safety harness, fire extinguisher, etc. (See "Trade Secrets," Jun '73 DRIVER) The racers are powered by 5000cc engine (305 cubic inches), of which at least 1000 per year were produced. They utilize push-rod-operated valve mechanisms, are limited to only 30 gallons of on-board fuel.

Speed and safety played
equal parts at fast L&M Championship race

AT THE RACES

LAGUNA SECA

by
Lieutenant LARRY RANDLETT

must roll onto the scales at a minium of 1350 pounds, and are approved by the Sports Car Club of America.

Unique to the L&M Championship is the way cars qualify for the main race. Unlike most races where starting positions are determined by qualifying lap times, the L&M Championship determined starting positions as a result of two qualifying heat races. The top 10 cars from each of the heats are gridded for the final race on the basis of fastest race

continued

Several days prior to the race, Skip Barber, driver for the Gene Mason Team, explained the intricacies of the Formula 5000 cockpit to Miss Laguna Seca Navy (Sharon Van Kleeck of Hayward, California). Gene Mason and Skip Barber announced they would support Navy Recruiting during this year's L&M series.

continued

NAVY DAY AT THE RACES

laps. The final four positions are filled by drivers selected by the race promoters to insure the big names will appear. As a result, fans are treated to three races rather than one.

NAVY DAY

All nine L&M Championship races run this year celebrated Navy Day. If Laguna Seca was a typical example, Navy Recruiting should be very happy with the favorable public exposure. There were "FLY NAVY" and "GO NAVY" banners all around the course, as well as a large "FLY NAVY" sign on the hill in the infield. Additionally, the Navy provided a 65-foot model of the aircraft carrier *USS Hancock*, a Navy information tent (doing a booming business), a model of a fleet ballistic missile submarine, an exhibit of a full-size Navy station wagon customized in a "Fly Navy" motif.

Everywhere, people were sporting buttons celebrating "Navy Day at Laguna Seca," while a formation of five airplanes sky-typed recruiting messages. The race ceremonies were opened with the National Anthem while a Navy Color Guard carried the American and Navy flags. The pace lap was led by three former P.O.W.s, Major Norbert A. Gother (USAF), Captain Thomas J. Hanton (USAF), and Lieutenant Roger G. Lerseth (USN).

"GO NAVY" RACE CAR

One of the big features of the weekend was the "Go Navy" race car driven by Skip Barber. This is a cooperative venture between the Navy Recruiting Command and the Gene Mason Racing Team.

Racing fans who follow the sport closely know Skip Barber as one of the most experienced and successful of America's single-seater race drivers. To his credit are national championships in Formula Ford and Formula B. Additionally, he has proved to be genuinely competitive in Formula I (Grand Prix) competition.

Skip has started his 1973 assault on the L&M Championship circuit carrying the message of the U.S. Navy. He still holds lap records at Watkins Glen and Road America from last year's series. His outstanding performance at Laguna Seca gave notice to his competitors that the Gene Mason Racing Team is a real contender for the L&M Championship.

THE DRIVERS

In addition to Skip Barber, the L&M Championship features the following outstanding drivers:

Graham McRae—Having already won the 1973 Tasman Series for Formula 5000 cars in Australia and New Zealand, Graham is confident he will do well in the L&M Championship this year. After all, he is the defending champion and is driving a car of his own design.

David Hobbs—As the 1971 champion, David is confident that 1973 is to be his year. He will also compete in the Can-Am, and will drive cars at Indianapolis, Ontario, and Pocono. In the past, he has driven for such respected racing teams and individuals as Team Lotus-Cortina, Lola, Ferrari, Reg Parnell, and Stirling Moss. This year Hobbs is hot!

Brett Lunger—An ex-Marine (4 years) with 2 years in Vietnam, Brett is now facing a new kind of battle. Last year he finished third in the L&M Championship, and promises this year he will be better. He is one of the most talented drivers on the circuit, and is very determined. Watch him.

Jody Scheckter—After a number of racing successes in his native South Africa and in Europe, Jody has announced that he comes to America to win the L&M Championship. He is very good, and is my prediction to take it all.

Peter Gethin—A two-time European Formula 5000 champion, Gethin made racing history in March when he won Britain's Race of Champions—first time a Formula 5000 has ever beaten Formula I machines in open competition. Champions like Gethin are alway powers to consider.

Kevin Bartlett—An accomplished Formula 5000 driver, Kevin replaces the winner of the series opener at Riverside, Brian Redman, in the Steed Lola. He was Australian driving champion in 1968 and 1969. At Laguna, Kevin is in a winning car and has Jim Hall, famous for his Chapparal racing cars, as his team manager. A potential winning combination.

THE RACE

Sportswriters have been touting the L&M Championship as the most exciting racing in America. Navy Day at

While cars raced wheel-to-wheel below, skytypers flew wing-to-wing above.

The racing was, for the most part, very close wheel-to-wheel competition. It was exciting, with danger minimized, due to the finely honed skill of the drivers, and racing machines in top condition.

Scheckter on his way to victory.

(above and right)
The Navy can boast having the world's most original staff car.

(left)
Miss Laguna Seca Navy, 22-year-old Sharon Van Kleeck of Hayward, California. An avid sports fan, she enjoys baseball, football, flying, and road racing. When asked what she likes most about racing, she says "The spirit of competition and the drivers, of course!"

Laguna Seca proved it. Most of the racing was very close, and all of it was very safe. While the cars are fast, they are not too fast, and the drivers are dedicated professionals who concentrate 100 percent on driving 100 percent of the time.

Even so, there were a few crunches during qualifying runs on Saturday. By the end of the day, Kevin Bartlett's team was busy repairing the tub (body/chassis) and the front suspension and, as a tow truck held Jody Scheckter's car, his crew was already assembling the parts to fix the rear suspension and wing. Brett Lunger was having a new nose fitted on his car, and Jon Woodner's crew had to fix both front and rear suspensions.

I asked one of the drivers how race drivers could have so many shunts (crashes) with no one injured. "It's simple," he replied, "these cars are loaded with safety devices. The seat belts keep us in the car and behind the wheel. As you can see, by staying with the cars, no one gets hurt."

The first heat for qualifying began at noon on Sunday, and everyone seemed to have their cars repaired from the previous day. David Hobbs (fastest qualifier) and Jody Scheckter shared the front row for the 30-lap heat. As the race started, Sheckter jumped out to a quick lead and, by the end of six laps, had a 6.35-second lead over second-place David Hobbs. Scheckter won by 19.03 seconds, averaging 112.85 mph.

The second heat featured Brett Lunger (Hobbs' teammate and second fastest qualifier) and Peter Gethin on the front row. But on the first lap, Graham McRae and Brett Lunger tried to occupy the same space at the same time and it didn't work. Eventually, both cars retired and were placed at the end of the final race starting grid. The heat was

continued

Skip Barber, Miss Laguna Seca Navy and Admiral Tidd (reading DRIVER magazine).

continued
NAVY DAY AT THE RACES

handily won by Peter Gethin with a 12.42 second lead over the second-place car, but the average speed was only 109.08 mph.

As a result of these two heats the cars were gridded as shown:

When the green flag fell for the 45-lap main event, Jody Scheckter immediately jumped into the lead. Meanwhile, Brett Lunger was giving the fans a thrill. On the first lap he moved from 21st to 13th.

Scheckter continued to stretch out his lead over second-place Gethin and third-place Hobbs. Lap 1, 1.27 seconds. Lap 7, 2.59 seconds.

By Lap 15, Lunger was 8th, while Scheckter had more than a 3-second lead and was still advancing. Scheckter's style is really something to watch. He's the type that gives it everything, ala Parnelli Jones.

Then, on Lap 20, Gethin started to reel Scheckter in and by the 27th lap Scheckter's margin was only 4.2 seconds; on Lap 33, 3.61 seconds. Lunger was now sixth, and Gethin was moving ever faster on Scheckter. But Jody's lead was too much for Peter to make up in a 45-lap race and Scheckter took the checkered flag by 2.30 seconds.

The 26,200 people went away from Laguna Seca wearing their "Navy Day" buttons and expressing their excitement over some tremendous racing. Most notable of all was the brilliant drive of Brett Lunger, who went from 21st to 6th. The fans loved Navy Day at the races. ●

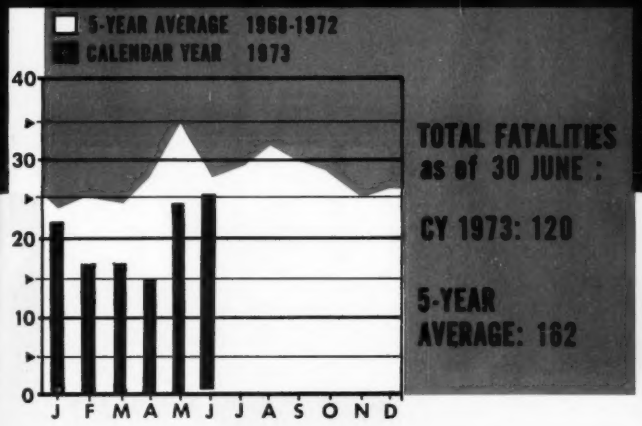
Laguna Seca L&M Grid

0-Jody Scheckter Trojan T101-Chevy 30:-18.32	8-Peter Gethin Chevron B24 A.S./Chevy 31:21.04
10-David Hobbs Lola T330-Chevy 30:37.55	51-Gus Hutchison March 73A HRE-Chevy 31:30.30
94-Eppie Wietzes Lola T330 CRM-Chevy 30:59.07	66-Kevin Bartlett Lola T330-Chevy 31:48.70
16-Max Stewart Lola T330-Chevy 30:43.12	5-Skip Barber March 73A Bolthoff-Chevy 31:29.91
74-Bob Muir Lola T330 31:03.20	18-Steve Pieper Lola T300-Chevy 32:01.03
30-Jon Woodner McRae GM 1 Bartz-Chevy 31:18.45	47-Eddie Miller Lola T300 Bartz-Chevy 32:16.73
73-Tony Adamowicz Lola T330 Woods-Chevy 30:45.69	87-Michael Brockman Lola T300 31:50.15
23-Tony Settember McLaren M10/18-Chevy 30:59.64	46-Doug Barrow Lola T300 Bartz-Chevy 31:27.97
37-Horst Kroll Lola T300-Crm 30:25.97	52-Syd Demovsky Surtees TS8 HRE-Chevy 31:39.87
84-Merle Brennan McLaren M10A-Chevy 30:45.96	76-Gary Burke Spartan-Chevy 32:11.24
9-Brett Lunger Lola T330-Morand no time	1-Graham McRae McRae GM1 no time
3-Frank Matich Matich A51-Holden no time	12-Bob Lazier March 735-A-Chevy no time

THE PURSES

1. Jody Scheckter new record, 111.62 mph, $15,750
2. Peter Gethin, $8850
3. David Hobbs, $5700
4. Gus Hutchison, $3550
5. Eppie Wietzes, $2600
6. Brett Lunger, $1800
7. Jon Woodner, $1600
8. Eddie Miller, $1450
9. Skip Barber, $1300
10. Steve Pieper, $1150

Laguna Seca winner Jody Scheckter was very calm prior to the race, enjoys reading DRIVER.



TOTAL FATALITIES as of 30 JUNE :

CY 1973: 120

5-YEAR AVERAGE: 162

A monthly recap of selected accidents—presented solely in the hope some will benefit from the unfortunate experiences of others

HOW GOES IT?

EXCESSIVE SPEED

Rank: Amn **Type vehicle:** 1972 Kawasaki 750cc motorcycle

The Amn was killed when he lost control of his motorcycle at an estimated 60 to 70 mph on a two-lane road, on base, at 1745.

The bike skidded 130 feet, went off the right shoulder on a steep hill, and became airborne. The machine struck the hill three times before impacting a steel fence post and rail, head-on. The impact split the rider's helmet down the back.

Probable cause:
Loss of control at excessive speed.

Possible contributing factors:
Bald rear tire; rider could have been blinded by sun or by an insect striking his face, since he was not wearing eye protection; small animal on road; loose gravel.

PEDESTRIAN FATALITY

Rank: Capt **Type vehicle:** Civ POV

While on a shopping tour in a foreign city with two female companions, the captain attempted to walk across a busy highway at 0055 and was struck by a car and thrown into the path of a second car. She died shortly afterwards.

Probable cause:
Unsafe act; attempted to cross busy highway.

ONE TOO MANY

Rank: Sgt **Type vehicle:** 1972 Triumph TR-6 convertible

There were three persons in the passenger compartment of the two-seater sports car when the accident occurred at 1900, on base.

As the driver attempted a left curve on a clear, dry road at an estimated 35 to 40 mph, the car struck the curb, rolled and came to rest on its right side. A non-USAF female civilian occupying the space between the two bucket seats suffered a broken right arm, contusions, and abrasions. The Sgt driver escaped injury, but his Amn passenger in the right seat was killed.

Seat belts were installed for the two seats, but were not used. Use of alcohol by the driver was confirmed by investigators.

Probable cause:
Failure to negotiate curve.

Probable contributing factors:
Failure to use seat belts; female passenger's position could have interfered with driver's control; driving under the influence of alcohol; excessive speed.

FAILED TO STOP

Rank: 1st Lt **Type vehicle** 1963 Chevrolet van

The Lt drove his Corvair east, past a stop sign, and struck a Ford ½-ton pickup headed north across the intersection. The pickup, in turn, struck a Matador waiting at a stop sign in the westbound lane.

The Lt driving the van suffered multiple injuries when thrown forward over the steering wheel and partially ejected out the front window. His Lt passenger was ejected out of the van's right front door and killed. No crash restraints were installed in the van.

The civilian driver of the pickup, who was not wearing his seat belt, was critically injured. The driver of the sedan was buckled in, and the secondary crash was slight, so both passengers were only shaken up.

Probable cause:
Failure to heed stop sign.

Possible contributing factor:
Inattention.

SHORT SHORT STORY

Rank: A1C **Type vehicle** USAF 5-passenger pickup

A1C and passenger survived head-on crash . . . seat belts used. Civilian driver killed . . . seat belt not used. ●

MOTORCYCLIST OPINIO

In the past, "OPINIONS" has been slanted to the auto driver and his thoughts concerning various questions. DRIVER raps this month with the motorcyclist, who is becoming more and more a part of the highway scene.

We queried two experienced riders and two novices about the motorcyclist's special riding concerns and how some of them relate to the auto driver. It's important for all of us to get into the heads of the two-wheel riders, because they *do* have unusual problems that often involve the car driver.

We hope more of our readers, especially the bikers, will share their thoughts with us on the two-wheeler's unique requirements for safe riding. Write to: Editor, DRIVER Magazine, AFISC/SEDD, Norton AFB CA 92409.

The answers have been edited only for space considerations. Opinions expressed are those of the individuals, and do not necessarily represent the position of DRIVER.

Here are the questions:

1. When you're riding your motorcycle, what is it that auto drivers do that bugs you most?

2. Have you ever attended a military-sponsored motorcycle course and, if so, what do you think about it?

3. What safety devices do you think all street bikes should be equipped with?

4. Do you think there should be a special course for trail bike riding?

5. Have you observed other bikers performing grossly unsafe acts on the road?

6. What first influenced you to buy a bike?

Comments.

ONS

SSgt Carl Spurgeon, USAF
Phoenix, Arizona

1. The inconsideration shown to motorcyclists by most motorists. They make left turns in front of you like you aren't even there. Most of them don't realize how fast a bike is approaching, and they have poor judgment in estimating that speed.
2. Yes, I have. And right now I'm instructing in such a course. Maybe I'm prejudiced, but I think the beginner can learn a lot about his bike, how to ride it, and how to handle himself in a course like this. At least, he'll learn what *not* to do.
3. A pair of rearview mirrors is the best safety device you can have, after a helmet, of course. With only one mirror, you have to turn your head to see what's coming up behind you on the other side. Taking your eyes off the road in front is asking for trouble.

If you have a big "hog," you need crash bars. There's no way you are going to get that machine off your leg if you dump it. I like my windshield, too. It keeps the bugs and junk off my face in the summer, and helps deflect the cold air in the winter. I use a face visor all the time, but I love that windshield.

4. Definitely, all bike riders should learn dirt riding. The urge to get off the road once in a while is too great to be ignored, and a guy needs some good instruction if he's going to head out for the boonies. It's a whole new ball game out there in the cactus, and you should have a good idea of what you're getting into before you start.
5. Some squirrel splitting lanes on the freeway. There's no way out if anything happens. Too many bikers depend on the car driver to do the right thing. Not me; I keep my eyes open and pay attention to where I'm going, and to what's going on around me all the time.

I've also seen motorcyclists pulling into traffic on a main road and cutting it too close for comfort. If that engine quits, or even misses a couple of beats, they've bought the farm. You have to leave yourself some escape room all the time. If the car in front stops fast, and the car behind doesn't stop fast enough, the biker is the baloney in the sandwich.

6. I bought my first bike about 5 years ago to use as a second car. Comments: My full-coverage bike insurance costs me more than my full-coverage auto insurance. Insurance companies figure bike rates on the age of the bike and its engine size. They don't consider the driver's experience or his age.

When I'm on a long road trip, I always take a rest about every 45 or 50 minutes. It gives me a chance to walk around a little and stretch my legs, and to look over my bike.

Helmets are the biggest thing that ever came along in motorcycling. They more than double your chances of survival if you have an accident. Full leathers are great, but expensive; heavy denims are a good substitute, and GI boots are better than nothing. Low-quarter shoes aren't any good, and tennis shoes are unbelievable. Those rubber soles will grab the street and throw you right off the bike.

I use reflective tape on my helmet, and wear a reflective vest all the time I am riding. Another thing I do is turn on my lights, day or night. It's surprising how far a headlamp can be seen in daylight.

continued

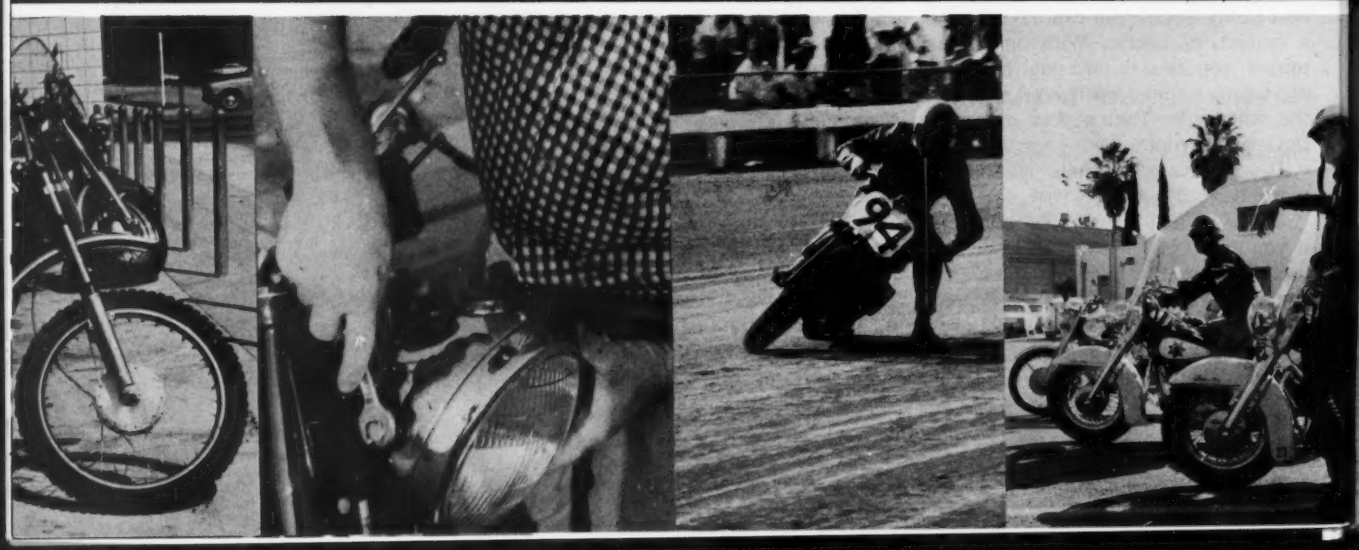
Sgt Danny Napier, USAF
New Albany, Indiana

1. I'm still new at this game, but I especially don't like to have cars pull up to my right side at a corner. That makes it too hard for me to see what's coming from that direction. I stay mostly toward the center of the lane so the driver in front can easily see me in his mirror.
2. I'm right in the middle of the motorcycle training course, here. I think it's great. We've got a couple of instructors who know what they're talking about, and that's half the battle.
3. You've got to have two good mirrors. I don't care much for a windshield, but that's a personal thing. Also, I don't believe in crash bars. They aren't going to do you any good if you get hit on the side. All they do, as far as I can tell, is protect the bike if you drop it.
4. I don't know anything about dirt riding, but I think a dirt course would be just as good as this street course we're getting now.
5. I can't say that I've seen any real boners on the road. Right now, I've got all I can do to keep track of myself, never mind the other guy. Pulling stunts in the streets is for the birds.
6. I bought my first bike after I enlisted. Before that, I got to liking bike riding from my experiences on friends' bikes.

Comments: My wife doesn't operate a bike. Sometimes she rides shotgun with me, but she doesn't really care for it. She has her own helmet and goggles, though.

SSgt William M. Carugno, USAF
Albuquerque, New Mexico

1. The lack of judgment on the part of most car drivers. They'll look you right in the eye when you're approaching them, and then they'll misjudge your speed. I hate a tailgater. If a guy is doing it just to bug me, I'll pull off the road and let him go past. There's no sense in trying to fight that kind of thing.
2. You bet I have. And not just because I'm working with the course here, either. I first learned my riding the hard way, and I know it's a lot better for a beginner to have someone show him how to do it right.
3. Crash bars are a necessity, and I like windshields. They deflect the bugs right up over my helmet. I use a face visor, but that windshield is just great.
4. Most definitely, dirt riding should be taught. I've been riding for 23 years, and have a lot of dirt racing experience. It's a whole new set of rules, and you have to know what you're doing out there. Too many guys go hog wild in the desert. They spend more time picking themselves out of the cactus than they do riding. Another thing—a rider shouldn't go into the desert without a first aid kit, a tool kit, and lots of water. Boy, you've got to have lots of water or you'll dehydrate pretty fast, and that's deadly. Also, a guy should never go desert riding alone; he should have a buddy along—just in case.



5. I see 'em every day. About the worst I've seen is the guy who cuts between car lanes. That's nothing but mad! If a car drifts over into his lane, he's had it. At freeway speeds, he hasn't got a chance.
6. I bought my first bike when I was a kid with a paper route. I kept it about 2 years and then moved up to a bigger machine, and I've been biking ever since.

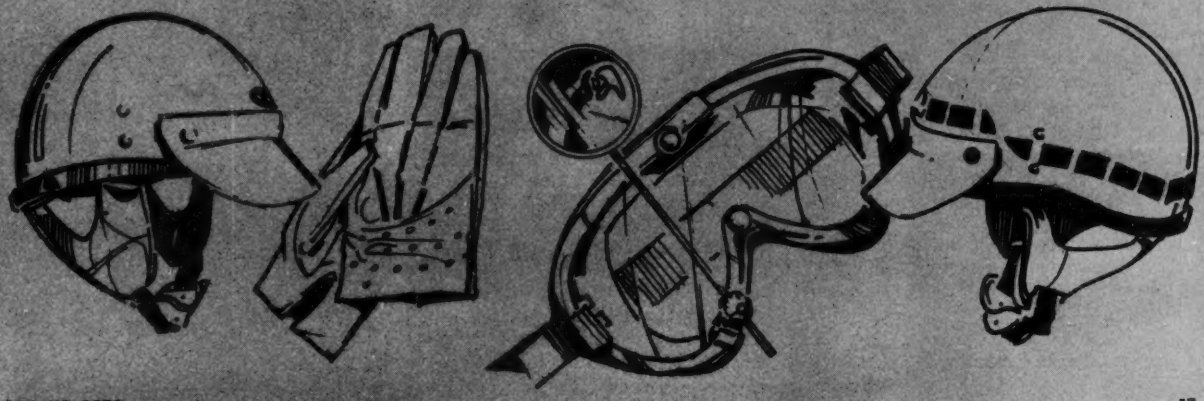
Comments: My 15-year-old son is getting to be pretty good on a dirt bike, and my wife has tried it a couple of times, too.

A1C Steve Norton, USAF
Baltimore, Maryland

1. I'm new at this stuff, myself. I just got my bike 3 weeks ago, so I haven't had much time to notice what other drivers are doing. I take it slow-and-easy when I'm in traffic on the road.
2. Sure, I think motorcycle courses are good. I'm in one myself right now, and not because I have to be, either. I really want to learn how to handle my bike, and a course is the best place to learn.
3. I don't have turn signals on my bike yet, but I'm going to get them. I'm also going to have a second mirror put on, because I want to be able to see behind me on both sides.
4. I've got a street-modified dirt bike, so I'm looking forward to some desert riding. Yes, I think a dirt school would be great. These guys around here tell me it's altogether different out on the desert than it is on the streets.
5. I'm too busy most of the time just keeping clear of things, so I don't get to see much of what other people are doing.
6. I bought my bike for a second car. My wife uses the car for work, and I ride my bike. I get five to six times the gas mileage she does, even when I'm out practicing and doing a lot of stopping and starting.

Comments: The first piece of equipment I bought, once I had my bike, was my helmet. I am completely convinced a good helmet is a lifesaver. I am also going to buy some regular bike-riding boots and some heavy jeans. I've got reflective tape on my helmet, and I'm going to stick it on my jeans, too.

The best thing a beginner rider can do is to get hold of an experienced biker and learn from him. That's why this course is so good, we've got two top riders showing the rest of us how to do things right. Practice, and lots of it, in a safe place is the next thing. When I was still learning which hand was which, and pulling the clutch instead of the brake, I did it out here on our training course where I had plenty of room for wild mistakes. If I had practiced on the street, I probably would have had an accident. ●



This month we conclude our two-part safe boating series with more timely tips from the Coast Guard. We'll discuss Float Plans, boat launching, how to safely get the load and passengers on board, nautical "rules of the road," and a few pointers on nautical charts. Finally, we've got some info on good boating practices to use when you are under way.

THE FLOAT PLAN

The most important thing you can do for the overall safety of yourself and your passengers before you go boating is to fill out a Float Plan (Fig. 1). You can get free copies of the Float Plan from any marine insurance office.

A Float Plan is like the flight plan that pilots file before they take off, and serves the same purpose. Fill out your Float Plan completely, and leave it with a responsible person. Then, if you don't get home within a reasonable time, that person can notify the Coast Guard. The information from your Float Plan will give them a good idea of where to begin looking for you.

Stick to your Float Plan, and be sure to cancel it when you return.

RAMP LAUNCHING

Launching your boat from a ramp is no big thing if you go about it in a straightforward manner. First of all, don't allow anyone to be in the boat while it is being launched. Untie the tie-down straps and, if you have it already mounted, tilt the outboard up so it won't scrape the ramp. If you have an inboard/outboard drive, tilt the outboard drive unit up. Have someone standing outside the car to signal directions as you back slowly down the ramp. Keep backing until the stern is in water deep enough to float the boat free when it is pushed off the trailer. Stop the car, put the transmission in "Park" if an automatic, or "First" if a stick shift. Switch off the engine, and set the parking brake before getting out to help push the boat off the trailer (Fig. 2). The boat should be secured by the bow line to the trailer winch until you are ready to float it free of the trailer.

Once the boat is floating free, and you have someone on land holding onto to bow line, move your car and boat trailer off the ramp so the next boater can launch his craft.

Board your boat over the bow and move it carefully to a dock or mooring. After you have tied up, you can load the boat, install and hook up the outboard if it isn't already in place, and prepare to get under way.

LOADING THE BOAT

When you load your boat, be sure to keep the weight as low as possible. Stow everything securely; your boat will move around in several directions (up, down, and sideways, as well as forward) when it's under way, and who wants soggy sandwiches in the bilges?

Have a seat for every person on board, and remind them to stay seated while the boat is under way (Fig. 3). Make certain that everybody on board has a personal flotation device (PFD) handy, (wearing them, if required), and that the youngsters wear theirs all the time they are on board.

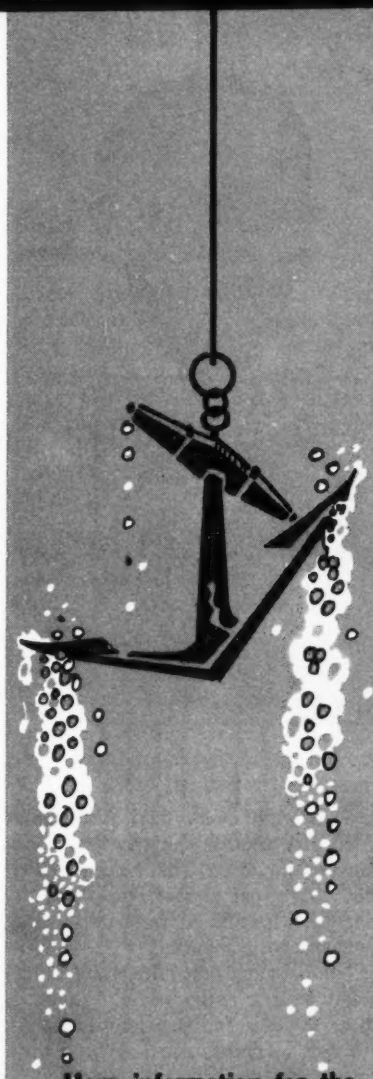
So, now, everything checks out. The passengers have been filled in on what they need to know, and the weather is fine. (You checked this out before you left home, with a phone call to the local weather bureau.) You have left a completed Float Plan with someone at home, and you've got your charts handy. You're all set to cast off.

A FINAL CHECKUP

There she floats, your pride and joy, ready for a fun trip on the water. Everything is spick-and-span on board, the motor is tuned, the gas tank is full; everything is ready to go. But is it? One

continued

Part 1 of *BEFORE CASTING OFF* appeared in the July issue of *DRIVER*.



More information for the boating enthusiast

BEFORE CASTING OFF

PART II

DRIVER

This sailboater has the right-of-way, according to the nautical "rules of the road," but he is a sure loser if he tries to fight that multi-thousand-ton freighter. The huge, ocean-going ship can't possibly turn out of the sailboater's path, and the smaller craft should turn aside. This is a case where being chicken is the wise thing to do.

FLOAT PLAN

of _____
(name of boat owner)

IF TROUBLE OCCURS while you're cruising on your boat, help will come faster if the Coast Guard or other rescue agencies know *where to look for you.* For your safety and your family's peace of mind complete this form—leave it with a responsible person whom you can depend upon to notify authorities if you're overdue.

IF OVERDUE, CONTACT _____
(name, phone number of nearest Coast Guard Rescue Coordination Center or other rescue agency)

BOAT: Name of vessel _____ Length overall _____
Registry number _____ Color of hull _____ *(white hull, blue top, etc.)*
Power _____ *(inboard, outboard, sail)*
Radio aboard _____ *(transmit frequency)* _____ *(receive frequency)*
NUMBER OF PERSONS ABOARD _____

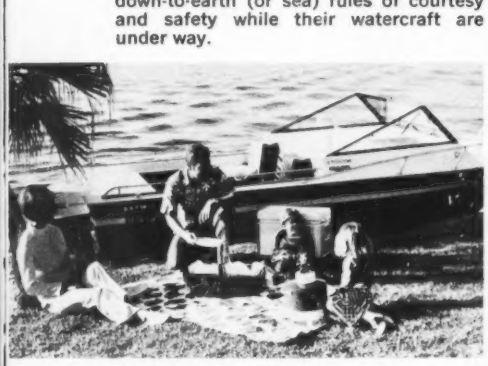
DEPARTURE FROM _____ DATE & TIME DEPART _____
DESTINATION _____ DATE & EST. TIME RETURN _____
ROUTE OR CRUISING PLANS _____

(Fig. 1)
The Float Plan is free life insurance. If you use it, and get into trouble on the water, the Coast Guard will know where to look for you.

(Fig. 2, right)
A good launch is an important step in a boating trip. Have enough help on hand to assist with getting the boat into the water.

(Fig. 3)
Horseplay in a boat can produce new candidates for Davey Jones' Locker. Sensible boaters remain in their seats and don't sit on the gunnels. They also wear their personal flotation devices (PFDs).

"The Good Ship Lollipop" out of San Francisco takes part in the Opening Day Celebration in early May. This is when the season's calendar of racing and regattas begins. Music, dancing, refreshments, and fun are the order of the day for all boaters. Even so, they observe the down-to-earth (or sea) rules of courtesy and safety while their watercraft are under way.



What it's all about. A family fun cruise, with perhaps a picnic along the way. Summer boating can be fun for everyone.

last check around before you cast off may turn up something you have forgotten. As the skipper, you have a lot of responsibility.

How about that anchor line; is it securely fastened to the anchor and to the boat? Sound silly? You'd be surprised how many boaters lose expensive anchors and lines because they aren't secured, or run aground when the anchor is not ready for use.

The anchor line should be at least 7 times longer than the depth of water in which you plan to cruise. This length gives the anchor enough slack to allow it to dig into the bottom, and helps prevent jerking it loose when your boat rocks and pitches.

Experienced boaters tell us the best way to put the anchor over the side is to let it out, hand-over-hand, until it reaches the bottom. Throwing the anchor overboard makes for tangles, and someone could be jerked over the side if a foot gets caught in the line.

Sailboaters should also take a final look around their watercraft before they hoist sail. Why not try out the bilge pump just one more time? Sailboats usually take a lot more water over the gunnels than do power boats.

Now you should be ready to cast off.

UNDER WAY

Once free of the mooring, proceed slowly until you are well clear of other moored boats and are sure your wake won't rock them.

Water speeds are deceiving. You can't stamp on a brake pedal to slow your boat, so allow yourself plenty of room for maneuvering and stopping. The Coast Guard says your best way to approach a mooring is to slow down to a crawl and approach it from the downwind side. This keeps the wind from

Coast Guard-approved emergency signal kit includes two day/night hand-held flares, a miniature strobe flashing light, a small flare gun, seven signal flares, and web belt.

(left, inset)
This boater knows how to refuel his craft. He keeps the hoze nozzle against the metal filler hole to prevent static electricity sparks. He is also watching to see that there will not be any overspill when the tank is filled.

This unhappy boater experienced motor trouble, and the Coast Guard sped to his rescue. It's all in a day's work for the Coast Guard, and the summer boating season will see a lot of this sort of thing.

(left)
Sailboaters have fun, too—but it's wetter fun than power boaters have. Waterproof clothing is a real necessity for sailboaters.

(right)
Sailboats, like power boats, come in many sizes and classes. All are fun to use if you know how to handle them. The best place to learn is at a Coast Guard Auxiliary or Power Squadron boat-handing class.

blowing your boat into the dock and perhaps endangering the craft and your passengers.

Keep an eye on the engine gages when you're under way, and don't exceed your cruise range. A good rule of thumb is to never use more than one-third of your fuel on the outbound trip. This leaves you a safe two-thirds of a tank for the home stretch.

Watch out for the "water cowboy," the speedster who has little regard for other boaters. Surface swimmers are to be avoided at all costs, so keep an eye out for them—especially if you are cruising near the shore. Scuba divers, too, are a hazard you must watch out for. Generally, they display a small distinctive flag on a float in the water above their location—but not always.

A pair of good binoculars will help you spot many of these hazards in plenty of time to avoid them. Binocs are a "must" item on a well prepared boat.

RULES OF THE ROAD

Boating has its own "rules of the road." These rules are thoroughly covered in the boating classes. Like road traffic rules that protect as well as restrict, the nautical rules have been written to give equal rights, responsibilities, and protection to all boaters.

The Coast Guard distributes a number of free pamphlets covering these rules; or you can get copies from your marine insurance company.

MAPS AND CHARTS

Sailors use maps, as do motorists, to plan their routes; but sailor's maps are called "nautical charts." Nautical charts are printed by the U.S. Coast and Geodetic Survey (USCGS), and are periodically updated. A nautical chart will show you everything you will need to know about the water in which you intend to cruise. Water depths are shown in fathoms (1 fathom = 6 feet). Dangerous shoals are clearly defined on all USCGS charts.

Nautical charts are a "must have" item for every boater, and can be purchased at any good marine supply store. Check the currency date when you buy yours, and make sure you get the latest edition.

CLEAR SAILING, MATES

Summer boating can be a lot of fun for the whole family, or it can be a disaster. To make sure your boating summer is a fun time, all you have to do is to use common sense and live up to the "rules of the road." And keep a weather eye on that chart! Have a happy boating summer. ●

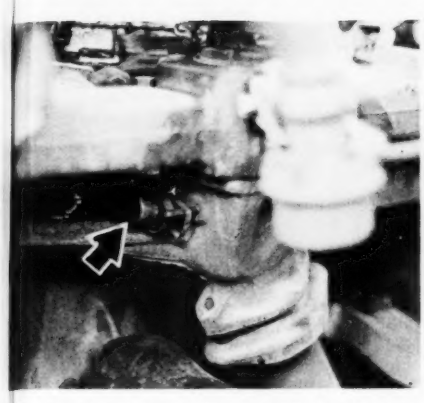
THE BACK-YARD MECHANIC PART VIII

EMISSION CONTROL DEVICES

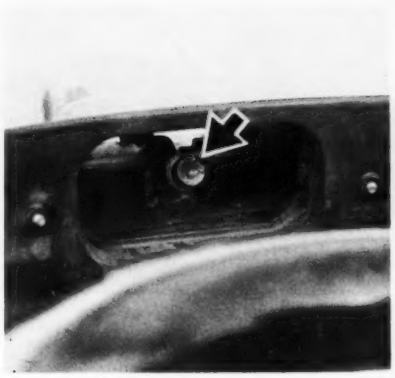
Last month's "Back-Yard Mechanic" discussed maintenance of the common PCV and air injection systems. This month, we'll begin with the nearly universal manifold heat control valve/thermostatic air cleaner and cover the rest of the smog devices in use today.

Note: As stated in the previous installment, if your car's emission systems are under warranty, the vehicle should be taken to a certified mechanic to keep the warranty in effect. Also, emission systems vary somewhat, and the procedures outlined here should be considered only as general guides. Consulting a service manual before doing any emission system work is essential.

(Smog pictures courtesy Los Angeles Air Pollution Control District)



1 **The heat riser** valve (arrow), located on the exhaust manifold or exhaust crossover pipe, is critical to engine performance, gasoline economy, and emission control. Check it regularly for free operation.



2-2A **Ford's thermo air cleaner** system uses a thermostatic unit (arrow) to control the air snorkel and heated air duct. If the valve does not operate properly, the thermostatic unit should be replaced.

The battle against air pollution has resulted in the manufacture of some rather sophisticated automotive emission control devices during the past 4 years. However, maintaining these newer systems is nearly as easy as caring for the older, less complex devices. In most cases, all you need is a can of aerosol choke cleaner or similar solvent, a vacuum gage (available for less than $5 at any auto supply store), and, of course, a trusty service manual.

Regular maintenance of *all* smog devices is essential for controlling harmful auto emissions which result in air pollution. But correct operation of some of the more recent devices is especially critical in a couple of other areas. A malfunction in any one of these devices can drop engine performance, cause dangerous engine stalls, and waste all kinds of gas. The latter is a big consideration, now that gas stations are getting to you at more than 40¢ a gallon in many areas.

HOT AIR

In 1968-69, the thermostatically controlled air cleaner system was introduced to replace, or in some cases bolster, the air injection system. The thermo system ducts heated air into the air cleaner to raise the combustion temperature of a cold engine. This reduces hydrocarbon emissions by improving engine efficiency during warm-up—a period when efficiency is low and emission correspondingly high.

The thermostatic air cleaner system evolved from the simpler manifold heat control valve (heat riser), however, which was originally designed only to improve cold engine performance. Virtually every car which doesn't have a thermo system uses a heat riser, and some cars use both systems. Therefore, we'll discuss the heat riser before getting into the slightly more complex thermo systems.

HEAT RISER

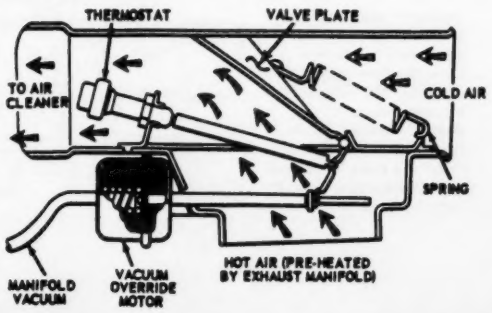
The heat riser is basically just a valve on the exhaust manifold which opens and allows exhaust gases to flow into the intake manifold when the engine is started cold. The heated manifold improves combustion until the engine warms itself. As the engine warms, a thermostatic control spring unwinds gradually to close off the exhaust manifold. When the engine reaches operating temperature, the valve should be closed to prevent overheating of the fuel mixture. However, corrosion frequently keeps the valve from operating freely, or even freezes it. If the valve sticks in the "no heat" position, the engine either stalls or runs poorly and wastes gas until it warms up. A valve sticking in the "heat" position causes the engine to run as if it is out of tune, so the heat riser should be checked regularly —at least at every tuneup.

Locate the valve on the exhaust manifold of in-line engines, or on the exhaust crossover of most "V" engines. With the engine cold, check to see that the thermostatic control spring is against its anchor pin. If not, or if the spring is broken, replace it.

Have a buddy start the cold engine and rev it quickly while you observe the valve's counterweight. If the valve moves about ½-inch and returns to its original position, then gradually closes as the engine warms, it's OK—spray the exposed ends of the valve shaft with solvent to keep the valve free.

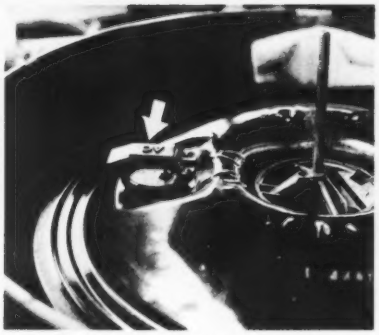
If the valve doesn't move when the engine is revved, soak the valve shaft with solvent and work the counterweight until the valve flops back-and-forth freely. Light taps with a hammer may be required to free a tightly stuck valve but it's well worth the time and effort.

Fig. 1 Ford Thermo System—Cold



Ford thermostatic air cleaner with engine cold. Note that all air that goes through air cleaner is from the duct over the exhaust manifold.

continued



3 The GM thermo unit is a vacuum-controlled device regulated by a temperature sensor (arrow).

4 If the snorkel of a GM system fails to close when a cold engine is started, check for at least 8 psi of vacuum at the diaphragm unit. Low vacuum means a leaking hose or connection is causing the problem. If the vacuum is sufficient, replace the diaphragm.

5 The temperature sensor is probably faulty if the snorkel valve doesn't open properly as the engine warms. Lift the air cleaner and check for vacuum at the line which runs from the engine to the sensor. If there is at least 8 psi, replace the sensor.

continued

THE BACK-YARD MECHANIC

THERMOSTATIC AIR CLEANER

The thermo air cleaner, which evolved from the heat riser, is basically a more precise device for controlling engine warmup and the amount of pollutants expelled during this period. There are two basic thermo systems, the Ford and the General Motors devices. Chrysler products use the GM system, and American Motors cars use a device very similar to Ford's. Although the mechanics of the two systems differ, their operation is nearly identical. When the engine is cold, the air cleaner intake snorkel closes off, and a valve opens allowing heated air from the exhaust manifold to enter the air cleaner as intake (Fig. 1).

While the engine warms, the air snorkel gradually opens and the heated air valve closes, allowing a mixture of heated air and outside air to enter the carburetor. When the engine reaches operating temperature, the air snorkel should be open and the heated air duct closed, since no more heated air is needed to keep the engine running efficiently (Fig. 2).

There are special thermometers and techniques to make sure that the thermo systems are right on. But the specifications are reasonably broad, and if your car runs satisfactorily during warmup and checks out according to these general procedures, it should be OK. However, if you determine the system is not operating correctly, it's best to have it accurately calibrated by a certified mechanic.

FORD THERMO SYSTEM

The Ford device uses a thermostatic control spring connected to a single valve which controls both the air snorkel and heated air duct (Fig. 1). To check this system, first make sure the air cleaner is properly connected to the heated air pipe or hose. With the engine temperature below 85°F (a thermometer can be placed in the air cleaner to check this), the air snorkel should be closed off by the valve. If not, check for a broken thermo control spring or a binding valve. A binding valve can be freed with solvent. Replace the thermostatic unit if the spring is broken.

Start the engine and let it idle. As the engine warms, the valve should slowly open the air snorkel and close off the heated air duct. If this does not occur, replace the thermostatic unit. Before the engine reaches operating temperature, you should test the vacuum override.

With the engine idling, rev it quickly. The valve should pop open and give the engine a needed breath of air to keep it from stalling. If it doesn't, pull the vacuum line which runs to the override unit, and check for at least 15 in. of vacuum with the gage. If the vacuum is low, there is probably a bad connection or leaking hose. If the vacuum is sufficient, but the override doesn't work, replace the vacuum device (called a motor by Ford).

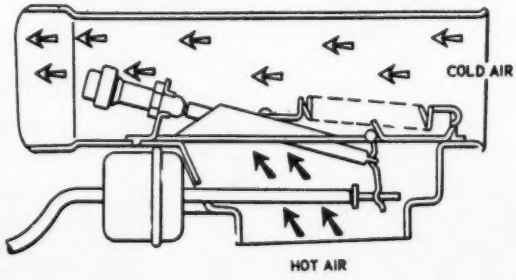
GM THERMO SYSTEM

The GM device uses a pivoting valve in the air cleaner neck similar to the Ford system, but differs in that it is vacuum controlled (Fig. 3). The GM device also has a vacuum override system which opens the air valve to prevent a cold engine from stalling when accelerated.

To check the GM system, begin with the engine cold and not running. The valve in the air snorkel should be *open*. The valve should close immediately when the engine is started. If it doesn't, the temperature sensor inside the air cleaner is probably faulty (Fig. 3). Lift the air cleaner body and install the vacuum gage to the line which runs from the engine to the bottom of the temp sensor. If

Fig. 2 Ford Thermo System—Hot

As engine warms up fully, all air comes from the air cleaner neck. The valve has been moved to block off the exhaust manifold duct. Below: Vacuum motor can be tested by removing from air cleaner and connecting it to a source of engine vacuum.



6 **Readings** at the vacuum advance unit are used to determine if the car's vacuum advance/retard controls are working correctly. Most cars use several of these devices, and a manual should be consulted for the specifics of the devices your car uses.

7 **A special** pressure vacuum filler cap must be used on all cars equipped with a fuel evaporative system.

there isn't 8 in. of vacuum at the sensor, look for leaks or bad connections. If the vacuum is adequate, replace the sensor.

VACUUM CHOPPERS

Introduced with the thermostatic air cleaners as "clean air packages" on many 1969-70 cars were various types of carburetor and distributor controls. The most common of these controls, generally called vacuum choppers, are designated to eliminate spark advance below a certain speed, and during deceleration. These devices cut down on emissions, but can dangerously cut engine performance and kill your gas mileage if they're not doing their thing. They should be checked at every tuneup, or any time the car seems to be down on power and everything else checks out. Your manual tells exactly what advance/retard systems your car uses, and gives specific checkout procedures.

There are three types of vacuum choppers, all of which can be easily checked for general operation. The Ford, General Motors, and American Motors systems are checked in essentially the same manner. The car's rear end must be supported off the ground to allow the wheels to be turned by the drive shaft. The safest way to do this is to drive the car against a solid wall (on a level surface) such as concrete block garage wall. Then, raise the car's rear end just enough to get the wheels off the ground and support the car with safety stands. Be extra sure the stand's locking pins are fully exended through the holes, and chock the front wheels.

FORD

The Ford vacuum chopper uses a speed sensor device which doesn't allow vacuum advance below 18 mph on acceleration or below 23 mph on deceleration. If the operating temperature is below 58°F, however, a sensor overrides the vacuum chopper. This allows spark advance at all speeds to prevent cold engine stalling.

To check the Ford system, pull the vacuum line which runs from the carburetor to the advance unit loose at the unit and attach the vacuum gage. With the car properly raised, supported, and at operating temperature, have a helper slowly accelerate (with the transmission in gear) until a vacuum reading is obtained—this should occur around 18 mph.

Nonexistent or incorrect vacuum readings can be caused by a broken speedometer cable, faulty speed sensor, or leaking vacuum line. Have the system inspected by a mechanic if the vacuum readings are incorrect and all connections check out.

The temperature sensor (usually located in the door—check your manual) may also cause incorrect vacuum advance. The temp sensor can be checked by cooling it with ice and checking the vacuum reading as before. If full vacuum advance isn't available with the sensor below 58°F, replace it.

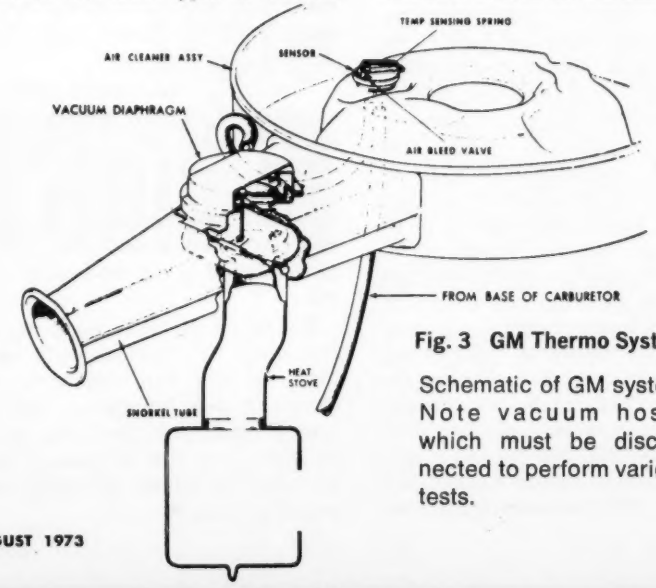


Fig. 3 GM Thermo System

Schematic of GM system. Note vacuum hoses which must be disconnected to perform various tests.

GENERAL MOTORS

The GM system is controlled by a transmission switch that allows vacuum advance when the car is shifted into high gear. The device can be generally checked; but, because of the complicated operation of the system, the car should be taken to a qualified mechanic if the chopper is malfunctioning.

With the car properly raised, and the vacuum gage attached, have your helper accelerate to about 25 mph with the transmission in high gear, or until an automatic transmission shifts

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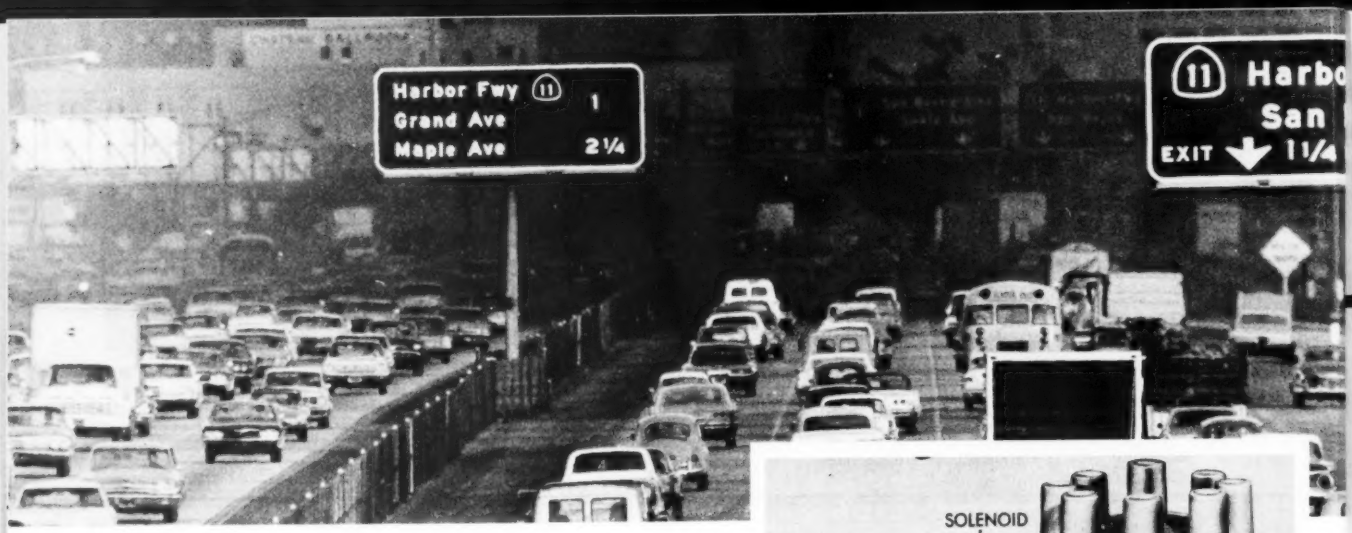

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THE BACK-YARD MECHANIC

(Figures 1, 2, 3, and 4 extracted from AUTO REPAIRS YOU CAN MAKE, ARCO Publishing Co, Inc.)

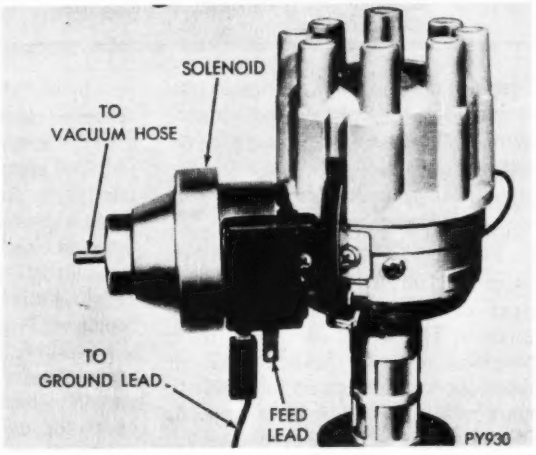


Fig. 4

Chrysler distributor with solenoid control

to high. The gage should show vacuum with the car operating in high gear. Vacuum should drop when the car is decelerated in a lower gear. If not, check for a leaking vacuum line —any other problems should be handled by a certified mechanic.

The GM system also uses a low-temperature override similar to Ford's. Locate the temp sensor (your manual gives its location) and check it as with the Ford system.

AMERICAN MOTORS

American Motors cars also use a transmission-controlled advance system—check your manual for the specifics.

CHRYSLER

The Chrysler vacuum chopper is designed to retard the spark whenever the throttle closes. It can be easily checked with the car resting normally on the ground. Locate the ground wire which is connected to a switch at the carburetor throttle stop screw (Fig. 4). Run the engine at idle and disconnect the ground wire. If engine speed increases when the wire is disconnected, this means the vacuum advance is kicking in and the unit is operating properly.

FUEL EVAPORATIVE SYSTEM

The two most recent emission control devices are the ones which account for most of the weird hoses running everywhere under the hood—the ones which scare off many a would-be back-yard mechanic. Actually, neither of these systems require much maintenance, and shouldn't freak you out. The first device is the fuel evaporative system, adopted in 1971 to control hydrocarbon emissions from fuel vapor loss.

Basically, the evaporative system is just a closed fuel system which reroutes wasted liquid fuel back to the gas tank to be reused. It also stores fuel vapors instead of venting them to the atmosphere. The evaporative system doesn't generally require any maintenance except for a periodic replacement of the charcoal canister (used for storing fuel vapors) or its filter, if so equipped. Your manual outlines the required maintenance on this system. Problems can develop in the system, however, and if you smell excessive gas vapors, or if the engine starves from lack of fuel, have the system checked out by a mechanic.

A pressure vacuum gasoline filler cap must be used with the fuel evaporative system. A standard cap would render the emission system ineffective, and could cause the fuel tank to collapse.

EGR

The most recent emission system is the Exhaust Gas Recirculation (EGR) system. The EGR is designed to reduce nitrogen oxide emissions by recirculating exhaust gases into the intake manifold to dilute the fuel charge, which reduces peak flame temperature.

The EGR's operation is relatively simple, with its main component being a vacuum-operated valve. The different types and variations of EGR systems are too numerous to cover here, but easy procedures for maintaining the system used on your car can be found in any up-to-date manual.

So, this is generally the smog device story. You're stuck with 'em—like it or not. And, since these devices rob your horsepower and kill your gas mileage if they're not working right, you can do yourself and everyone else a favor by taking proper care of them. ●

continued from page 2

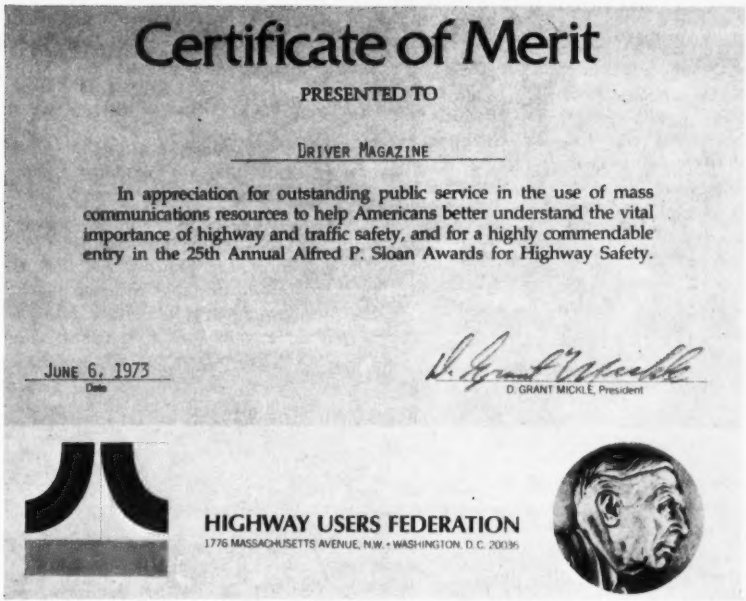
DOUBLE CLUTCH

As this happens, this signal freak makes a bad move. He floors it. Depending on his distance from the intersection, and available horsepower, he quite often reaches a good speed like, say, 50 mph. At this point he is committed to going through the intersection. His speed prevents his stopping in time. So, as it usually happens, he roars through an instant AFTER his light has turned red, and yours . . . well, you can see what may happen.

Anyway, the point is that a traffic signal is a *symbol*. Because it is green, it does not necessarily follow that the intersection is cleared, and safe for passage. That's why it's better to have a quick look in both directions . . . before you get hung up on a traffic light. •

...1971...1972...1973...

third time running


Certificate of Merit
PRESENTED TO
DRIVER MAGAZINE
In appreciation for outstanding public service in the use of mass communications resources to help Americans better understand the vital importance of highway and traffic safety, and for a highly commendable entry in the 25th Annual Alfred P. Sloan Awards for Highway Safety.
JUNE 6, 1973
Date
D. GRANT MICKLE, President
HIGHWAY USERS FEDERATION
1776 MASSACHUSETTS AVENUE, N.W. • WASHINGTON, D.C. 20036

On 15 June, Major General Ernest C. Hardin Jr., Commander, Air Force Inspection and Safety Center, Norton AFB, California, received a letter from the Highway Users Foundation which said: "Congratulations on DRIVER being selected to receive a 1973 Alfred P. Sloan Award* for distinguished public service to highway safety . . . "

In his letter to Brigadier General Charles E. Yeager, Director, Aerospace Safety, General Hardin said: " . . . this award traditionally recognizes the most outstanding highway safety publication and the fact that DRIVER magazine has received this award for the last three consecutive years reflects great credit upon those responsible for its publication..."

General Yeager said: "An accomplishment of this magnitude could not have been achieved without the support, directly or indirectly, of all members of the DRIVER staff far beyond the parameters of normal duty requirements."

**The Award is made in the name of Alfred P. Sloan Jr., a former president and chairman of General Motors Corp., and a pioneer in the organized highway safety movement.*

In acknowledging the Award, the editor and staff of DRIVER wish to extend their sincere thanks to all personnel whose letters, suggestions, comments, and story ideas have had such an important part in the magazine's continued acceptance and credence. Without your wholehearted support, we could not have won the Award. •

ABOUT MISS DRIVER

(see back cover)

Lovely Janet Alford comes from Pearl City, Hawaii, and now lives in San Bernardino, California. She is interested in some day becoming a professional Hawaiian dancer.

Janet is 21, and has been driving five years. She cautions DRIVER readers to take their driving seriously, and says, "Goofing off behind the wheel is not the way to get your kicks." •

BACKFIRE

Address your letters to:
Editor
DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

TRICKY FILTER

I read your informative "Back-Yard Mechanic" article, Part III, Mar '73 issue with much interest, but was disappointed that you failed to mention pre-filling the replacement oil filter.

Most cars utilize a full-flow oil filter system which results in the engine being improperly lubricated until the oil filter has been partially or fully filled. Take a tip from an ex-drag racer: this can affect the engine's life.

Maj Lelan Stanton
Hq 164 Mil Alft Gp
Tenn ANG
P.O. Box 18026
Memphis TN 38118

We omitted this suggestion because the risk is not critical during the short period involved—provided you don't tear out immediately. There should be enough oil clinging to the engine parts to protect them as the filter absorbs its initial share while the engine is idling. Also, installing a pre-filled filter on some cars can be tricky because of the filter's location, and some are installed horizontally. So, with those reservations, we pass this on as a possible good tip.

HELP MAY BE ON THE WAY

I found the May issue of DRIVER most interesting. I was especially interested in the "Opinions" feature and the comments by Sgt Gene Reynolds concerning the availability of "a new deal" for service drivers in auto insurance at more reasonable rates.

It is ironic that, while we stress safety and laud our training and concern for these men, they still don't qualify for the same lower insurance rates enjoyed by a civilian student with good grades.

I would very much appreciate any further details on the company and program mentioned by Sgt Reynolds, and any information you may have on similar plans. With the current emphasis on a volunteer army, I just may be able to get someone interested in the problem.

It would appear that the problem is service-wide, and all our service personnel could be better served by a fairer rating system.

Lt Col, U.S. Army
Name withheld by request

Thank you, Colonel. Nothing is more pleasing than to find a senior officer working to rectify unfair practices affecting his troops. The company in question affords special rates only to Air Force personnel in California. The company representative says the lower rates are based on favorable low-accident experience in the San Bernardino and Vandenberg AFB areas; also on the blue-suiters' longer tours of duty. He acknowledged, however, that, with the advent of the all-volunteer force, a liberalizing of his company's philosophy could occur. Perhaps other companies will follow suit.

NEW TIRES/LOW TRACTION

I had a set of steel-belted radial tires installed on my car. While leaving the tire store, an unwanted strip of black rubber led me to believe the traction was not up to that of the old tires. I tried a couple of hard-brake applications before entering the freeway, and the first try almost made me lose control of the car. In fact, I got considerably sideways before getting it back.

Now that I have a couple of hundred miles on the new tires, the traction has improved. Perhaps DRIVER readers should be warned that the initial traction on these tires is lower than normal (and perhaps on all new tires). Possibly, this is the price you pay for long tire life—I got 59,000 miles from my last set.

Capt Warren S. Kirkland
63 Aerial Port Sq (DA)
Norton AFB CA 92409

Your experience was a bit extreme, but some traction loss is not unusual, according to our tire contacts. A low-speed break-in period is recommended (below 60 mph for the first 50 miles) for all new tires. DRIVER's September "Tire Special," originally scheduled for July, will cover the subject more thoroughly.

IT'S THAT SIMPLE

Your answer to Capt Thompson (May '73 "Backfire") stated, "Impact locking inertial systems do prevent drivers from cinching in tightly." True; however, a method of overcoming slack in the system is to adjust the seat travel slightly farther back than normal, connect the belt, and then move the seat forward to a point where the belt is snug.

MSgt Harold Edwards
Det 6, 3300 Support Sq
Lackland AFB TX 78242

Thanks for the tip.

WE'RE NOT "GUYS"

I am a WAF who has been in the service a little over 2 years. During some period of that time I've been on mandatory POV Teams and have had to read DRIVER; other times I've just read it because it usually has some good articles.

I have probably read every issue published since I've been in. However, I feel your magazine is directed toward the male reader. For example, Miss DRIVER always starts her little "blurp" off with "Hi, guys," or "Hi, fellows," and it gets a little irritating. I'm neither a guy nor a fellow! The female reader is out here, also, and we'd like to be recognized.

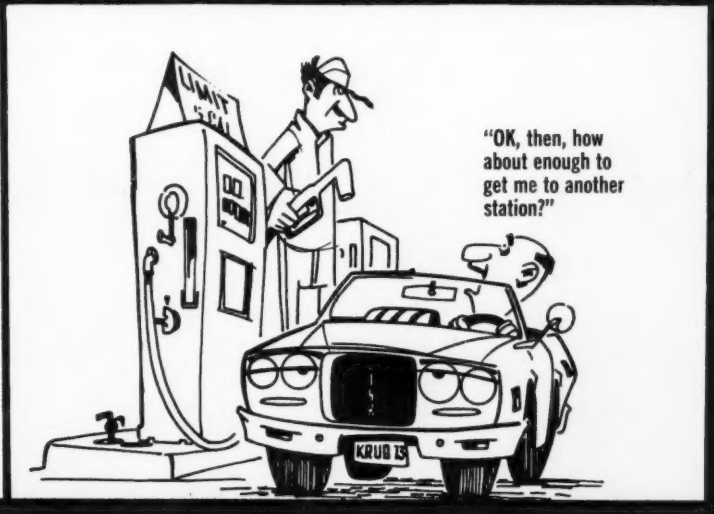
Sgt Terri Meister
1839 Elec Intsl Gp
Keesler AFB MS 39534

Thank you very much for your interest in DRIVER, and for reminding us that the female reader would also like to be recognized.

Rest assured that Miss DRIVER, effective with publication of the July '73 issue, will no longer preface her safety messages with greeting to the male readers.

Receipt of your letter was an occasion, since we seldom hear from the distaff side of our audience. Please pass the word that we would like to hear from the feminine readership; perhaps their "Opinions" and/or letters in "Backfire" would afford DRIVER a happy change of pace. ●

☆U.S. GOVERNMENT PRINTING OFFICE: 1973—789-422/11



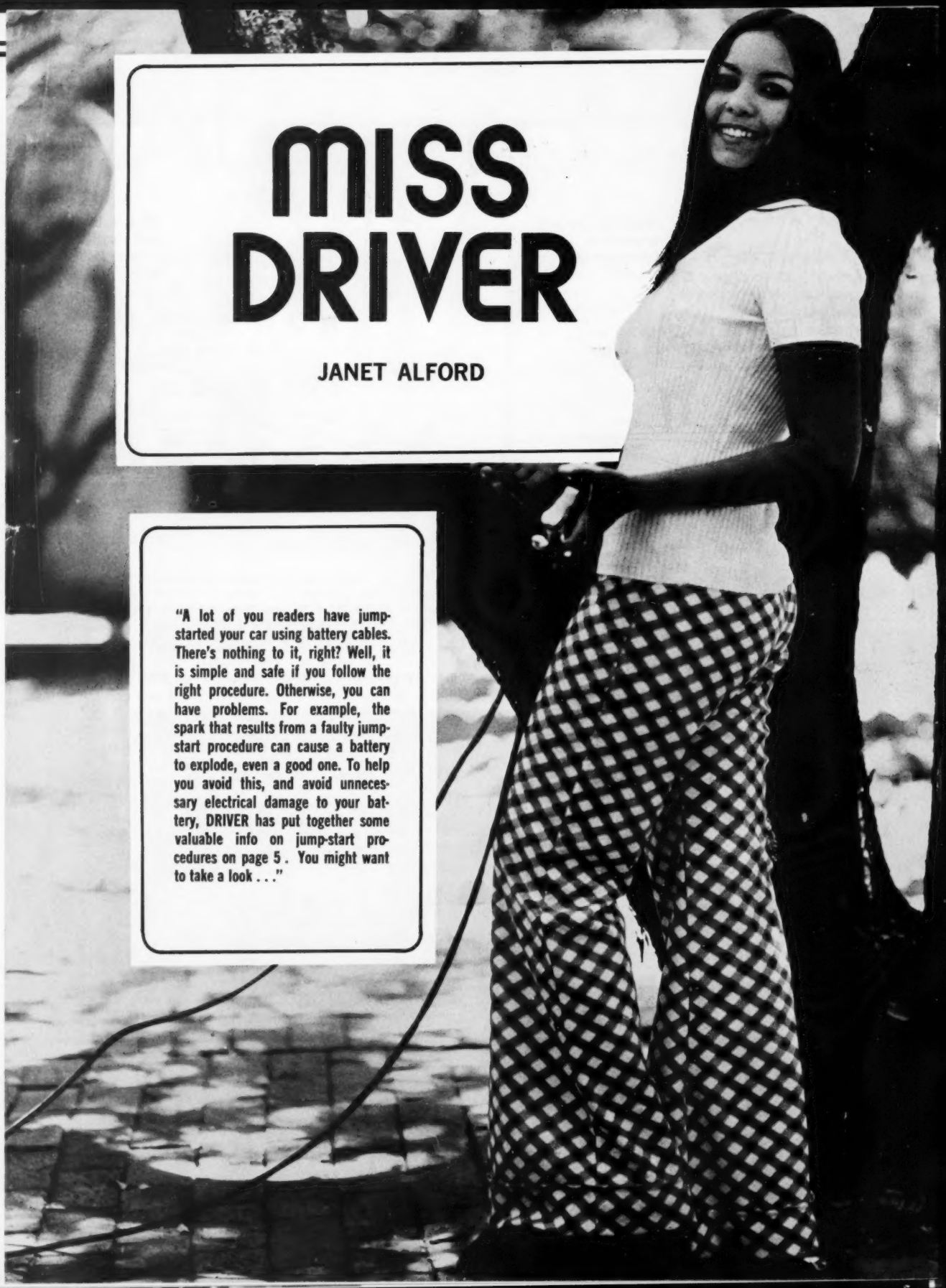
PET PEEVE

My pet peeve is the guy who drives his oversized camper down the left lane when he isn't going to make a left turn.

He doesn't realize, or doesn't care, that his huge vehicle completely blocks the forward view of the drivers behind him, and that they can't see traffic signals, on-coming traffic, or any of the many things they should be watching for their own safety.

People who drive view-hiding campers should keep to the right to be right.

Thanks to:
Pheloneus Y. Farquardt
43d Commissary Pushcart Repair Sq
New Frobish AFB, Idahoe



MISS DRIVER

JANET ALFORD

"A lot of you readers have jump-started your car using battery cables. There's nothing to it, right? Well, it is simple and safe if you follow the right procedure. Otherwise, you can have problems. For example, the spark that results from a faulty jump-start procedure can cause a battery to explode, even a good one. To help you avoid this, and avoid unnecessary electrical damage to your battery, DRIVER has put together some valuable info on jump-start procedures on page 5. You might want to take a look . . ."